

REMARKS

Entry of the foregoing and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, the instant specification at page 5 has been amended to clarify the disclosed [NCO]/[OH] molar ratio range. Support for such amendment can be found in the instant specification at least at page 3, lines 21-22. Claim 10 has been canceled without prejudice or disclaimer. Claims 1 and 18 have been amended to recite an [NCO]/[OH] molar ratio of 1:1.5 to 1:5.0. Support for such amendments can be found in the instant specification at least at page 3, lines 21-22. Claims 1 and 18 have also been amended to recite heating the first mixture to form a heated mixture comprising a prepolymer. Support for such amendments can be found in the instant specification at least at the paragraph bridging pages 5 and 6. Claim 17 has been amended for readability purposes.

In the Official Action, claims 10 and 18-20 stand rejected under 35 U.S.C. §112, first and second paragraphs. Specifically, the Examiner has taken the position that the ratio ranges concerning diisocyanate and polyol content set forth at pages 3 and 5 of the specification are inconsistent with each other. By the above amendments, the ratio range set forth at page 5 has been amended to clarify that such ratio range ([NCO]/[OH] molar ratio of about 1:1.5 to 1:5.0) is the same as the range set forth at page 3 of the specification. Applicants respectfully submit that usage of such exemplary [NCO]/[OH] molar ratio range can result in an exemplary polyurethane according to one aspect of the present invention.

Accordingly, for at least the above reasons, withdrawal of the §112 rejections is respectfully requested.

Claims 1-3, 9-12, 16-20 and 23 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,239,213 (*Ramanathan et al*) in view of U.S. Patent No. 5,312,865 (*Hoefer et al*). Claims 1-3, 9-12, 16-20 and 23 stand rejected under 35 U.S.C. §103(a) as being obvious over *Hoefer et al* in view of *Ramanathan et al*. Claims 18-20 stand rejected under 35 U.S.C. §102(b) as being anticipated by *Hoefer et al*. Withdrawal of the above rejections is respectfully requested for at least the following reasons.

Ramanathan et al relates to a process for the preparation of aqueous polyurethane dispersions by reacting a polyester polyol. See col. 1, lines 6-9.

Ramanathan et al does not disclose or suggest each feature recited in independent claim 1. For example, *Ramanathan et al* does not disclose or suggest mixing polycaprolactone diol with a difunctional isocyanate at an [NCO]/[OH] molar ratio of 1:1.5 to 1:5.0, in the presence of a water-miscible solvent having no reactive hydrogen to form a first mixture consisting of the polycaprolactone diol, the difunctional isocyanate and the water-miscible solvent, as recited in claim 1. In this regard, the recited first mixture that is formed by the mixing step a), and subjected to the heating step b), consists of the polycaprolactone diol, the difunctional isocyanate and the water-miscible solvent. That is, polyols which differ from polycaprolactone diol are excluded from the recited first mixture. *Ramanathan et al* does not disclose such claimed subject matter. Such deficiencies of *Ramanathan et al* have been acknowledged by the Patent Office at page 5 of the Official Action.

Hoefer et al fails to cure the above-described deficiencies of *Ramanathan et al*.

It would not have been obvious to the ordinarily skilled artisan to modify *Ramanathan et al* by replacing the branched polyester polyols disclosed therein with a polyol component containing only polycaprolactone diol as allegedly disclosed by *Hoefer et al*. Upon a fair and complete reading of *Ramanathan et al*, it is clear that the use of the branched polyester polyols is of central importance to the concepts disclosed therein. *Ramanathan et al* teaches that by use of such branched polyester polyols, alleged benefits of improved stability, water/chemical resistance and flexibility characteristics can be realized. As such, it would not have been obvious to the ordinarily skilled artisan to replace such branched polyester polyols with the polycaprolactone diol of *Hoefer et al*. Even if the use of a polycaprolactone diol was known, in view of the fact that *Ramanathan et al* is specifically directed to the use of branched polyester polyols, and is concerned with improving the performance of polyurethanes formed from such branched polyester polyols, the ordinarily skilled artisan would not have modified *Ramanathan et al* to eliminate the use of such branched polyester polyols.

For at least the above reasons, independent claim 1 is non-obvious over *Ramanathan et al* in view of *Hoefer et al*.

Furthermore, independent claim 1 is non-obvious over *Hoefer et al* in view of *Ramanathan et al*. In this regard, claim 1 recites heating the first mixture consisting of the polycaprolactone diol, the difunctional isocyanate and the water-miscible solvent, to form a heated mixture comprising a prepolymer, and adding a chain extender to the heated mixture comprising the prepolymer to form a second mixture. The alleged combination of *Hoefer et al* in view of *Ramanathan et al* fails to disclose or suggest such claimed subject matter.

In this regard, the Patent Office has relied on *Hoefler et al* for disclosing a two-pot process described at column 5, lines 44-50:

In the two-pot process, the polyol mixture is reacted with the isocyanate mixture in the usual way. To this end, the polyurethane prepolymer prepared as described above is stirred into a second water-filled pot and the neutralizing agent and optionally the chain-extending agent are subsequently added.

Quite clearly, the two-pot process of *Hoefler et al* does not employ a first mixture consisting of a polycaprolactone diol, a difunctional isocyanate and a **water-miscible solvent**. If the reaction "in the usual way" disclosed by *Hoefler et al* pertains to the reaction conducted in the one-pot process, such process employs an inert solvent together with the components capable of salt formation. See col. 5, lines 34-37. The recited first mixture consisting of the polycaprolactone diol, the difunctional isocyanate and the water-miscible solvent, however, excludes such components capable of salt formation employed in the one-pot process of *Hoefler et al*.

Like *Hoefler et al*, *Ramanathan et al* fails to disclose or suggest the use of a first mixture consisting of a polycaprolactone diol, a difunctional isocyanate and a water-miscible solvent. Moreover, while *Hoefler et al* relates to the use of a polyol mixture in which polycaprolactone diol is the primary component, *Ramanathan et al* teaches the use of branched polyester polyols. In view of such differences, the ordinarily skilled artisan would have recognized that parameters and method steps disclosed by *Ramanathan et al* would not have been considered to be easily interchangeable with those of the *Hoefler et al* process.

Furthermore, the applied documents do not disclose or suggest the polyurethane product recited in claim 18. As discussed above, the applied documents fail to disclose or suggest the use of a first mixture consisting of the polycaprolactone diol, the

difunctional isocyanate and the water-miscible solvent. In view of such deficiency, it is apparent that the applied art also fails to disclose the polyurethane product formed from such first mixture.

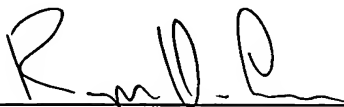
For at least the above reasons, it is apparent that independent claims 1 and 18 are neither anticipated by nor obvious over the applied documents. Accordingly, withdrawal of the above rejections is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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